

# CRT in ACHD

Aya Miyazaki<sup>1,2</sup>

<sup>1</sup>*Department of Transition Medicine, Division of Congenital Heart Disease, Shizuoka General Hospital;* <sup>2</sup>*Department of Cardiology, Mt. Fuji Shizuoka Children's Hospital;*

## Abstract Content

As the cardiac dyssynchrony, three types are observed, atrioventricular (AV), intraventricular and inter-ventricular dyssynchrony.

To improve intra and interventricular dyssynchrony, biventricular pacing device is used. We proposed the ventricular morphology-based strategy; the pacing lead position should be determined based on the ventricular morphology and the types of ventricular dyssynchrony.

In the single ventricular morphology (SV), the short axis dyssynchrony; it is the interventricular dyssynchrony in SV, is observed. QRS duration was reported to be correlated with the degree of the short axis dyssynchrony in an SV. Also, QRS duration was reported to be increased gradually after Fontan operation, and negatively correlate with peak VO<sub>2</sub>. Because CRT in an SV can be expected to be highly effective, early intervention by CRT should be considered when ventricular dyssynchrony exists.

In the systemic RV, heart failure develops at a high rate with aging. Pacemaker implantation (PMI) is one of the risk factor of heart failure, but pacemaker is necessary to maintain optimal heart rate. To maintain optimal HR and protect cardiac function, it is necessary not to hesitate the timing of PMI and to actively consider biventricular pacing when performing PMI. Effectiveness of CRT in systemic RV is reported lower than systemic LV and SV. Careful consideration of lead approach and lead position might be improved the effectiveness of CRT in systemic RV.

In the diseased subpulmonary RV, RV dyssynchrony is associated with decreased RVEF and pathological RV remodeling. Acute study of CRT showed a positive effect on acute hemodynamics, RV mechanics, and contractility. Permanent RV-CRT should be effective for the patients with subpulmonary RV dyssynchrony. Further studies are warranted.

Cardiac dyssynchrony needs to be carefully investigated and treated. Cardiac function in CHD is progressively worse. The disease specificity and the early introduction of resynchronization pacing must be considered.